In re Patent Application of:
HENDERSON ET AL.
Serial No. 09/939,517
Filing Date: **AUGUST 24, 2001**
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In the Specification:

      Please replace the first paragraph as added to page
3, line 27 in the preliminary amendment filed on August 24,
2001, with the following rewritten paragraph:

      This and other objects, advantages and features of
the present invention are provided by a method for detecting
lighting flicker in an output of a video imaging device having
a main picture area comprising an array of pixels for
producing successive images at a frame rate. The method
preferably comprises producing a series of signals from at
least one additional picture area adjacent the main picture
area. The at least one additional picture area has a size
substantially larger than a pixel, with each signal being a
function of light incident on the at least one additional
picture area in a time period substantially shorter than the
frame rate. A predetermined number of the series of signals
~~ar~~ are accumulated to form a series of compound samples, and
the series of compound samples are filtered to detect
components indicating the flicker.

      Please replace the third paragraph as added to page
3, line 27 in the preliminary amendment filed on August 24,
2001, with the following rewritten paragraph:

      Another aspect of the present invention relates to a
flicker-detecting video camera comprising a main picture area
comprising an array of pixels for producing successive images
at a frame rate, and at least one additional picture area
adjacent the main picture area. The at least one additional

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picture area may have a size substantially larger than a
pixel, and the at least one additional picture area may be
arranged for producing a series of signals each of which is a
function of light incident on the at least one additional
picture area in a time period substantially shorter than that
of the frame rate.

Please replace the sixth paragraph as added to page
3, line 27 in the preliminary amendment filed on August 24,
2001, with the following rewritten paragraph:

The video camera may further ~~comprises~~ comprise an
automatic exposure control circuit, and a second exposure
control circuit for setting an exposure period which is an
inverse of a frequency of the flicker or a harmonic thereof,
and a control circuit for selectively connecting the automatic
exposure control circuit and the second exposure control
circuit to the main picture area for controlling exposure
thereof based upon an output of the filter.

Please replace the paragraph beginning at page 5,
line 8, with the following rewritten paragraph:

Separate means ~~must~~ should be provided to control
the gain of each super-pixel 12, 14 to ensure its output
sample falls within its linear operating range while
maximizing dynamic range. As stated above, each super-pixel
12, 14 may be provided by connecting in common a column of
standard size pixels, as indicated by interconnection line 20
in FIG. 1.

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        Please replace the paragraph beginning at page 5,
line 15, with the following rewritten paragraph:

        The output of each super-pixel 12, 14 is then
operated on by a detection mechanism which will now be
described with reference to FIGS. 2 and 3. The following
description refers to the use of a single super-pixel. The
detection mechanism operates ~~ad~~ an infinitum on successive
length-N sequences f(n) of compound samples. Each compound
sample comprises one or more accumulated individual samples
s(a) of the super-pixel. Each compound sample is spaced apart
by an appropriate interval I, with the interval I being
referred to as the compound sampling interval.

        Please replace the paragraph beginning at page 7,
line 5, with the following rewritten paragraph:

        These instantaneous complex flicker energy readings
E ~~must~~ should be averaged over time in some manner to produce
a longer term estimate E' of flicker energy. One example of
an averaging mechanism is the first-order autoregressive
filter, or leaky integrator, whose ability to track phase
drift may be traded against noise immunity by its system time
constant μ, and updating long term average E' with an
instantaneous measure E:

$$E' = E\mu + E' (1 - \mu)$$

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Please replace the paragraph beginning at page 8, line 30, with the following rewritten paragraph:

A weakness of this scheme can arise under bright lighting conditions. Here the sinc function approaches the origin and no sinc function null can be found which corresponds to a desirable exposure setting. Without recourse to additional exposure control mechanisms such as LCD shutter or mechanical iris, a compromise ~~must~~ should be sought between acceptable banding and acceptable exposure setting. The invention thus provides a technique for detection and frequency identification of flicker which operates in the time domain, and which is applicable to both full-field exposure sensors and to rolling-window exposure sensors.

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